Passed March 7th 1828

An Essay on Empyema

For the degree of Doctor of Medicine in the University of Pennsylvania

by

Andrew Barclay

of

Virginia

14th January 1827.

Empyema

Pleuritis or inflammation of that membrane which lines the internal surface of the Thorax and affords and envelope to the thoracic viscera, may eventuate in several ways. 1st. by Resolution. 2nd Effusion of Serum 3rd Effusion of coagulating lymph 4th Effusion of Pus or puriform matter. 5th Gangrene The last, however is of very rare occurrence.

Resolution not having been accomplished by the efforts of nature or a judicious application of remedies and the inflammation being of a mild character and generally diffused over the membrane, an increased secretion of serum takes place, which collecting in the cavity of the Thorax constitutes Hydrothorax. The most frequent termination is, in the effusion of coagulating lymph and consequent

adhesions between the Pleura of the containing and contained parts, but the inflammation being of a higher grade, suppuration is induced forming Empyema, on which affection I purpose offering a few remarks as the subject of an inaugural dissertation.

Section 1st

The term Empyema is derived from εν and πυον which signify "pus within" and was used by the ancient cultivators of medical science to express merely an internal suppuration, without regard to the part of the body in which it occurred. By Aetius, however, who flourished about the end of the fifth century, its application was limited to a collection of pus within the cavity of the Thorax, and since that period it has been used exclusively in this sense.

Most commonly the disease is confined to one

side of the chest, tho' sometimes both sides are implicated constituting a Double Empyema. a condition as dangerous to the patient as it is discouraging to the practitioner of the healing art.

Section 2nd.

The commencement of Empyema is indicated by lassitude, coldness of the extremities and rigors of the trunk which in a few hours are succeeded by a preternatural degree of heat of the body that continuing for a longer or shorter period, gradually abates. The patient passes restless nights, his extremities often feeling cold, and his body covered by a profuse clammy perspiration. There is a cough that is hard and dry or attended with a mucous expectoration. The pulse is full and accelerated, and the tongue covered with a white fur.

The suppurative process being now fully established, and the matter beginning to accumulate, there is a sensation of weight at the Sero-bicubus Cordis and occasional slight dyspnœa. These become more distressing as the fluid increases in quantity, which having occured to a considerable extent, a fluctuation is perceptible, not only to the patient, but to persons standing by, on any sudden movement in the position of the body. This fluctuation becomes daily more evident and ascends until it can be distinguished above the superior margin of the Clavicle. That side of the Thorax becomes preternaturally expanded, the intercostal spaces becoming wider and œdematous. The œdema is not confined to the intercostal spaces extending sometimes over the whole of that side of the body on which the disease is situated, or to parts more or less remote, as to the Eye

lid or Extremities. The shoulder becomes conspicuous, elevated and the difficulty of breathing is now almost intolerable. There is an inability on the part of the patient to lay on the sound side, and he experiences considerable pain on attempting to elevate the arm of the affected side. The pulsations of the Heart are felt, in some cases, at a considerable distance from the usual point, from the displacement of this organ by the pressure of the matter

All these symptoms become more aggravated as the Disease advances, till finally by the ulcerative absorption, the matter is discharged externally or through the Bronchia by expectoration; or death ensues from suffocation, unless an outlet be afforded the fluid by an artificial opening. Sometimes the matter is absorbed, and the chest contracting by the ascent of the Diaphragm, the descent of

the shoulder and the approximation of the ribs to each other, the Lung is brought in contact with the parietes of the Thorax, between which adhesions take place and a natural cure is thus effected.

This is the usual mode of accession, progress and termination of this affection; tho it is possible for a considerable quantity of pus to exist in the Thorax, without giving rise to any symptoms sufficiently distinctive to indicate its presence.

Section 3rd.

The most ordinary cause of this affection is the influence of cold, to which the contents of the Thorax are peculiarly exposed, and hence it is most frequently met with in Northern climes, and particularly, those subject to sudden changes in the temperature of the

atmosphere.

It may result also from violence of any kind done the chest, as wounds, blows &c. as well as from extraneous bodies, as bullets, pieces of cloth, fractured or exfoliating ribs, entering the Thorax from the receipt of a wound, by which inflammation is induced and perpetuated, while the wound healing externally, the escape of the matter is prevented. The Pleura may participate in an inflammation primarily seated in the substance of the or be induced by the discharging of a Vomica into the pleural sac.

In some few cases, Empyema has been caused by the discharge of an abscess of the Liver.

Section 4th.

The existence of a fluid in the cavity of the chest may be ascertained by an exam-

ination by succussion. Percussion and Auscultation in conjunction with the signs that usually are presented.

By Succussion or shaking the body, a fluctuation is perceptible, which is more or less distinct in proportion to the extent of effusion

Instead of the resonant sound which the thorax emits by percussion in a healthfull condition of its viscera, a dull, obscure sound is produced by this mode of investigation.

In Auscultation it will be observed, that the noise occasioned by the entrance and exit of the air into and out of the air cells of the lungs, which is called the respiratory murmur, is deficient, as, also the vibration that is imparted to the parietes of the chest in speaking or singing.

Two other circumstances worthy of attention are the following. The difficulty of breath-

ing is very much aggravated by the recumbent position of the body or by pressure exerted on the Abdomen; and the inspiration is performed with less facility and convenience than the expiration.

With the presence of all these signs however, Empyema is not certainly known, since they are concomitant on many other affections. To arrive, therefore at a just conclusion in the diagnosis, it will be necessary to instigate an enquiry into the history of the case. If it be Empyema, the effusion will have been preceded by those constitutional symptoms which characterise the eventuation of inflammation in the production of pus. the least equivocal of which is the occurrence of rigors:- "it is a law of our nature says Dr Thomson" that rigors of longer or shorter duration, and of greater or less degrees of intensity, usually accompany the production

of pus in all the organs and regions in which it is formed

Section 5th.

The method of treating Empyema has been by evacuating the matter by an opening through the parietes of the Thorax, on the skin [illegible] of a common abscess. The want of success, however, that has generally attended this plan of treatment, offers little encouragement for its employment, further, than the urgency of the symptoms may demand the opening as a palliative measure. Few instances are on record when a recovery has succeeded the operation of Empyema; in almost every case the disease is hastened on to a fatal issue by [illegible], from the violence of the constitutional symptoms [illegible]

An opinion is entertained by medical gentlemen that the presence of the pus is the only

necessary to the expansion of the lung, and were it removed, a cure would ensue, by the lung coming in contact with the chest and forming adhesions. The improbability, however, of such an event is clearly demonstrated by examinations after death, when it is discovered, that the lung is enveloped by an adventitious membrane of such density of structure, that no effort of this organ at expansion could overcome its resistance, did it always retain its aptness for inflation; which it does not, partaking generally more or less in the morbid action.

Others, mean perhaps of the impracticability of this mode of cure and under the impression of obliterating, by the granulative process, a cavity intolerable to the animal economy, have after evacuating the matter, resorted to the use of astringent injections. This practice appears to me decidedly useless, since we are taught that

that serous membranes never granulate, and evidently pernicious, as it tends by exciting a new degree of irritation, to increase the discharge already too profuse.

The mode by which nature endeavours to effect a cure after the removal of the matter is as before stated by a contraction from the circumference of the cavity towards its centre. It would therefore appear reasonable, that by the operation of Empyema we might assist herein the design and ultimately effect a cure; but generally before this end can be accomplished, the patient is worn out by constitutional irritation and death terminates his sufferings.

Entertaining these views of the disease drawn from the experience of others, I am inclined to the opinion, that the operation should be deferred until that period, when the quantity of fluid becomes so great as to impede materially

the function of respiration by its mechanical action, and menace the approach of death from suffocation. Here, it must be considered inevitable, consistently with the protraction of life and consequently should be resorted to as the only alternative.

Section 6th.

The place usually selected for the operation is between the sixth and seventh rib, and equidistant from the Sternum and Spinal column. This perhaps under ordinary circumstances will be found the most advantageous situation for the opening; yet, there are certain conditions of the part, that may lead to the adoption of some other point. If a prominence exist on any part caused by the pointing of the abscess, then we are advised to make the opening. "We may also be directed to a particular spot" says Mr.

Charles Bell" by the long continuance of a fixed pain. It sometimes happens, that the Diaphragm has formed adhesions with the costal pleura, as high as the space mentioned as being usually selected, for the operation, in such a state of things, were the operation performed at this point, it would not only be ineffectual in affording an exit to the matter, but injury might result from protruding the instrument into the Abdominal cavity.

It would appear, therefore, that no fixed place can be laid down for the operation, but that one must always be decided on from the peculiar state of each case.

When a point has been determined on a large size Trocar will make an opening sufficiently large, where the escape of matter only is required; but, in those case where there is reason to suspect the presence of some foreign substance

it will be necessary to use a scalpel, that the substance may be removed also. "In four or five cases" says Professor Gibson "I have succeeded in floating out along with the matter, pieces of cloth and bits of exfoliating ribs, by throwing in injections of tepid milk and water."

Having thus evacuated the matter, and thereby alleviated the sufferings of patient in some degree, as much is accomplished as can be hoped for, the orifice should therefore be closed and healed by the first intention, while the patients system is supported by a nourishing diet and the whole tonic plan of treatment.